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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Mikhail Godin

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EXAMINER

ROJAS, BERNARD

ART UNIT

PAPER NUMBER

2832

DATE MAILED: 03/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/690,340

Applicant(s)

GODIN, MIKHAIL

Examiner

Bernard Rojas

Art Unit

2832

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-31 is/are allowed.
- 6) ☒ Claim(s) 1-19, 32, 34-37, 39 and 40 is/are rejected.
- 7) ☒ Claim(s) 20-23, 33 and 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 12/28/2005 have been fully considered but they are not persuasive. As to the 35 USC § 112 second paragraph rejection of claims 5 and 17, Applicant does not claim that the load is a spring, merely that the load characteristic corresponds to a spring with a spring constant k . As to the 35 USC § 112 second paragraph rejection of claims 9, 11, 12, 15 and 16, Applicant does not define the function of friction characteristics of the actuator. As to claim 1, Applicant has not claimed any specifics for the function of the load characteristics.

Applicant's arguments, see page 13, filed 12/28/2005, with respect to the Double Patenting rejection have been fully considered and are persuasive. The Double Patenting rejection of claims 1-40 in view of U.S. Patent 6,787,943 has been withdrawn.

Applicant's arguments, filed 12/28/2005, with respect to the rejection(s) of claim(s) 14-31, 33 and 38 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ishiyama [US 6,040,642].

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what the function of the load characteristics represents "wherein a plurality of magnets is further configured to provide a flux density distribution in the air gap as a function of the load characteristics".

Claims 14-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the flux distributions are linked to the undefined load characteristics, "flux distributions in an air gap provided by the sequence correspond to the load characteristics".

Claims 5 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what claim limitation "the load characteristics correspond to a spring having a spring constant K " means since every load can be represented as a spring having a spring constant K .

Claims 9, 11, 12, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what the function of friction characteristics represents "wherein the first plurality of magnets is further configured to provide a flux density distribution in the air gap as a function of friction characteristics of the actuator".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-12, 32, 34-37, 39 and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoyama et al. [US 5,808,381].

Claim 1, as best understood, Aoyama et al. discloses an actuator [figures 1 and 3] for operating upon a load having load characteristics, including a field assembly [1, 3] comprising a first plurality of magnets [1] configured to provide flux density distributions in an air gap [7]; and a coil assembly [2, 4].

Claim 2, Aoyama et al. discloses the actuator of claim 1, wherein dimensions of the first plurality of magnets are selected to provide a flux density in the air gap [col. 1 lines 5-15].

Claim 3, Aoyama et al. discloses the actuator of claim 2, wherein the first plurality of magnets are aligned in alternating groups, so that magnets in one of the alternating groups have a first polarity, and magnets in an adjacent alternating group have a second polarity opposite to the first polarity [figures 1 and 3].

Claim 4, Aoyama et al. discloses the actuator of claim 2, wherein the first plurality of magnets are positioned in a first set of aligned groups on a field blank, and at least one of the aligned groups of the first set of aligned groups includes a pair of magnets having the same polarity [figures 1 and 3].

Claim 5, as best understood, Aoyama et al. discloses the actuator of claim 2, wherein the load characteristics correspond to a spring having a spring constant K [since every load has a load characteristic that corresponds to a spring having a spring constant K].

Claim 6, Aoyama et al. discloses the actuator of claim 1, wherein the field assembly includes a first field blank [3] positioned to face a second field blank, the first and second field blanks each comprising a planar portion and additional sections which provide flux paths perpendicular to a direction of motion of the coil assembly, and further wherein the first plurality of magnets are positioned along the direction of motion on the planar portion of the first field blank [figures 1 and 3].

Claim 7, Aoyama et al. discloses the actuator of claim 6, wherein the first plurality of magnets are arranged in a first pattern of polarities, and further including a second plurality of magnets positioned on the planar portion of the second field blank to oppose the first plurality of magnets, and further wherein the second plurality of magnets are arranged in a second pattern of polarities which is a complement of the first pattern of polarities [figures 1 and 3].

Claim 8, Aoyama et al. discloses the actuator of claim 4, further including a second set of aligned groups of magnets positioned on an opposing field blank, wherein the first set of aligned groups are arranged in a first pattern of polarities, and further wherein the second set of aligned groups of magnets are arranged in a second pattern of polarities which is a complement of the first pattern of polarities [figures 1 and 3].

Claim 9, as best understood, Aoyama et al. discloses the actuator of claim 1, wherein the first plurality of magnets is further configured to provide a flux density distribution in the air gap [col. 1 lines 5-15].

Claim 10, Aoyama et al. discloses a linear actuator [figure 3] for operating upon a load having load characteristics, including a field assembly [1, 3] comprising distributed magnet field sources [1] which provide a flux density distribution in an air gap [7] corresponding to the load characteristics; and a coil assembly [2, 4].

Claim 11, as best understood, Aoyama et al. discloses the actuator of claim 10, wherein the distributed magnet field sources are further configured to provide a flux density distribution in the air gap [col. 1 lines 5-15].

Claim 12, as best understood, Aoyama et al. discloses a linear actuator [figure 3].

Claims 32, 34-37, 39 and 40, the method steps of configuring a linear actuator would have been necessitated by the product structure as described for claims 1-12, 14-17 and 19 previously.

Claims 14-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishiyama [US 6,040,642].

Claim 14, as best understood, Ishiyama discloses a linear actuator for operating upon a load having load characteristics, including a field assembly [figure 5] comprising a magnet structure which includes a plurality of magnets [13] arranged in a sequence so that at least two adjacent ones of the plurality of magnets having a first polarity are followed by at least another of the plurality of magnets having a polarity different from the first polarity [figure 5], and flux distributions in an air gap [7] provided by the sequence; and a coil assembly [21].

Claim 15, as best understood, Ishiyama discloses the actuator of claim 14, wherein the sequence of magnets is further configured to provide a flux density distribution in the air gap [figure 8].

Claim 16, as best understood, Ishiyama discloses a linear actuator [abs, fig. 1].

Claim 17, as best understood, Ishiyama discloses the actuator of claim 14, wherein the load characteristics correspond to a spring having a spring constant K [since every load has a load characteristic that corresponds to a spring having a spring constant K].

Claim 18, Ishiyama discloses a linear actuator wherein the magnets are selected so that the flux density distribution in the air gap decreases in a direction of motion of the linear actuator [figure 8].

Claim 19, Ishiyama discloses a linear actuator [figures 1-2] including a field assembly comprising a first field blank [12], a first plurality of magnets of one polarity followed by a second plurality of magnets [figure 5] of a different polarity positioned on the first field blank in a direction of motion of the linear actuator, and a coil assembly [21] including a generally planar coil comprising a first force generating portion spaced apart from a second force generating portion so that the first force generating portion is positioned over ones of the first plurality of magnets whenever the second force generating portion is positioned over ones of the second plurality of magnets.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aoyama et al. [US 5,808,381] in view of Ishiyama [US 6,040,642].

Claim 13, Aoyama et al. discloses the claimed linear actuator with the exception of the magnets being selected so that the flux density distribution in the air gap decreases in a direction of motion of the linear actuator.

Ishiyama teaches a linear actuator wherein the magnets are selected so that the flux density distribution in the air gap decreases in a direction of motion of the linear actuator [figure 8].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to alter the field strengths of the magnets used in the linear actuator as taught by Ishiyama in order to change the linear actuators response characteristics depending on the expected load.

Claim 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishiyama [US 6,040,642] in view of Denne [US 2002/0190582].

Ishiyama discloses the claimed invention with the exception of varying the widths of the magnets used to create the magnetic flux of the linear actuator.

Denne discloses a linear actuator composed of adjacent magnets of varying widths grouped by different polarities [figure 3].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to change the width of the magnets to create a different flux density pattern.

Allowable Subject Matter

Claims 24-31 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 24, the prior art of record does not teach nor suggest, in the claimed combination, a linear actuator operational in a direction of motion including a plurality of field sub-assemblies each comprising a field blank, and wherein at least one of the plurality of field sub-assemblies includes a first sequence of magnets of one polarity followed in the direction of motion by a second sequence of magnets of a different polarity, wherein the plurality of field sub-assemblies are positioned with respect to one another to form a gap between the at least one of the plurality of field assemblies which includes the sequences of magnets, and another of the plurality of field assemblies; and a coil assembly including coils positioned within the gap in a plane substantially parallel to the direction of motion.

Claim 28, the prior art of record does not teach nor suggest, in the claimed combination, a linear actuator operational in a direction of motion including a plurality of field sub-assemblies each comprising a field blank, wherein a first one of the plurality of field sub-assemblies includes consecutive groups of magnets, each one of the consecutive groups of magnets including a plurality of magnets arranged to have a selected magnetic polarity and to produce a selected magnetic flux density distribution in an air gap, and further wherein the first one of the plurality of field sub-assemblies is positioned with respect to a second one of the plurality of field sub-assemblies to form the air gap between them; and a coil assembly including at least one coil positioned in a plane within the air gap, wherein the plane is substantially parallel to the direction of motion of the linear coil actuator.

Claims 20-23, 33 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Rojas whose telephone number is (571) 272-1998. The examiner can normally be reached on M-F 8-4:00), every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin G. Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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